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ABSTRACT

A variety of departmental and student outcomes data was obtained and analyzed from faculty and graduating seniors in 27 academic departments located at a university classified by the Carnegie Foundation as a Research II institution. The purpose of the study was to determine: (1) whether strong research orientation by an academic department promotes or hinders student learning and growth; and (2) if differences in departmental teaching and research climates are associated with differences in the academic integration and intellectual growth of the undergraduates who major in those academic disciplines. The combined responses of over 650 randomly selected seniors, as well as interviews with deans and department chairs, showed that a vigorous research orientation by an academic department, particularly when combined with attention to teaching responsibilities, has a beneficial influence on the academic integration and intellectual growth of their undergraduate majors. Contains 29 references. (GLR)

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THE IMPACT OF FACULTY RESEARCH ACTIVITY ON MEASURES OF UNDERGRADUATE STUDENT GROWTH AND ACADEMIC INTEGRATION,

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This paper was presented at the Thirtieth Annual Forum of the Association for Institutional Research held at The Galt House, Louisville, Kentucky, May 13-16, 1990. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

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THE IMPACT OF FACULTY RESEARCH ACTIVITY ON MEASURES OF UNDERGRADUATE STUDENT GROWTH AND ACADEMIC INTEGRATION

ABSTRACT

Does a strong research orientation by an academic department promote or hinder student learning and growth? Are differences in departmental teaching and research climates associated with differences in the academic integration and intellectual growth of the undergraduates who major in those academic disciplines? This study examines these questions by analyzing a variety of departmental and student outcomes data obtained from faculty and graduating seniors in 27 academic departments at a Research II University.

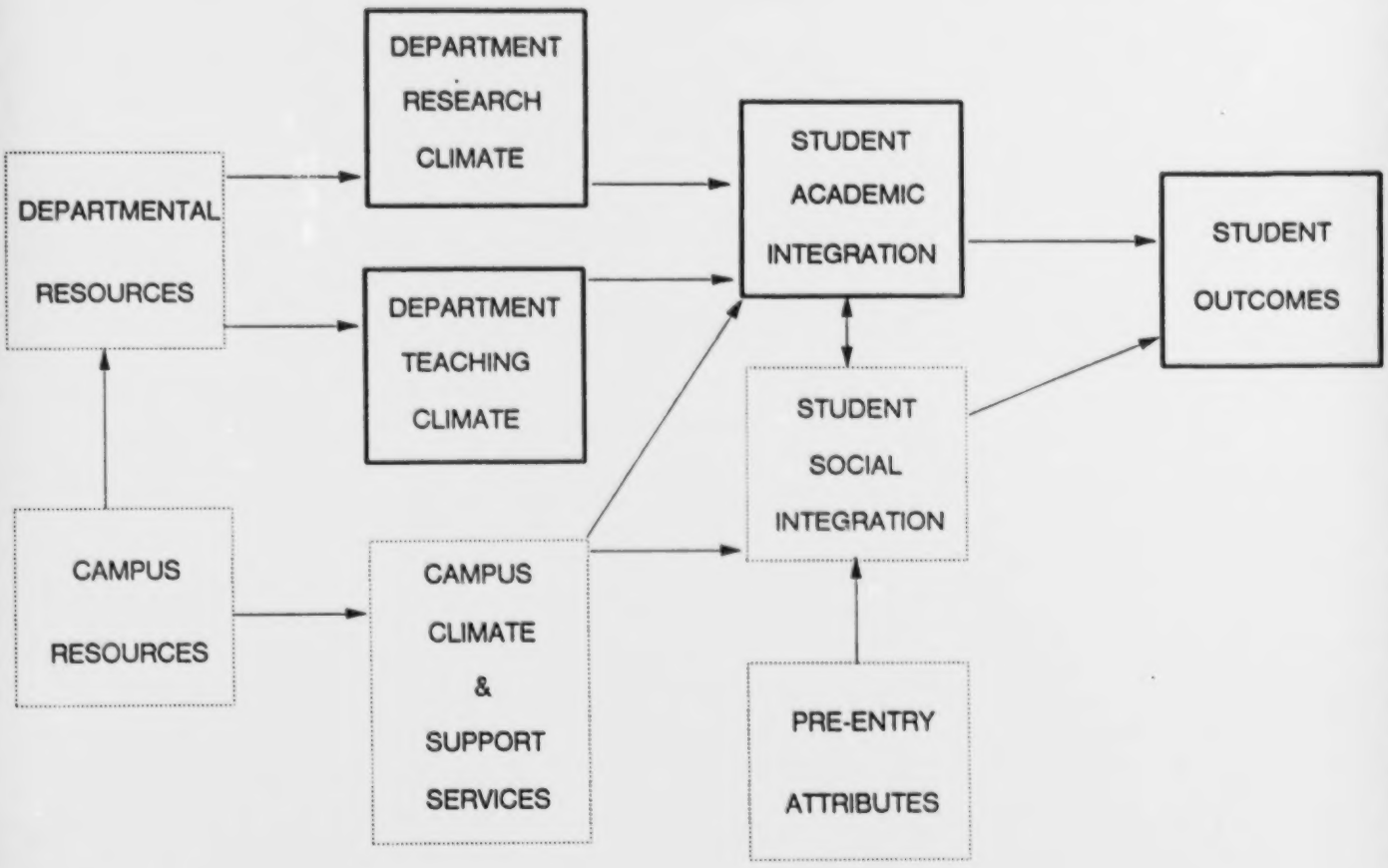
INTRODUCTION AND CONCEPTUAL FRAMEWORK

A major duality within American research universities is the tension between the discovery of knowledge and the transmission of knowledge. Caplow and McGee (1958) were among the first to study the interesting dichotomy created by faculty being hired to teach but paid to do research. A popular belief, especially among students, views research and teaching as being in conflict. Clark Kerr (1963) describes the "federal grant university" as one in which the best faculty are diverted from undergraduate education by the research lure of grantsmanship and graduate instruction. A more recent example is provided by the book Profscam, which paints an unattractive picture of faculty life--one which ignores the needs of students (Sykes 1988).

Other authors argue that research and teaching are compatible (Jencks and Riesman, 1968), that teaching fosters a love of knowledge which compells one to conduct research (Teague 1981), that the best faculty and best students both tend to be attracted to research univerities (Blau 1973), that student learning increases when faculty carryout research and scholarship, and that scholarly performance is the best test of one's ability to perform in the classroom (Bretton 1979). Certainly most faculty and administrators at research universities believe that teaching and research are not only compatible, but beneficial to each other (Jauch 1976).

Figure 1

Conceptual Model for the Study



Scholarly interest in the impact of college on students has given rise to a number of theories of student development, and these were recently reviewed by Terenzini (1987). There is now rather widespread conceptual and empirical support for the notions that faculty interactions are important sources of influence on student growth (Pascarella 1985) and that different organizational subenvironments within the same institution can have substantially variable influences on student development (Chickering, 1969,1988). The literature on academic organizations indicates the existence of variable department cultures or climates (Cameron & Ettington 1988) and these are expected to shape student learning, but there has been little empirical analysis of the linkage.

There are only a few studies which examine the relationship between faculty research activity and student ratings of instruction (Voeks 1962, Grant 1971, Friedrich and Michalak 1983) and their results are contradictory. Previous studies of faculty research activity have not looked at the academic department as the unit of analysis, nor at student growth as distinct from student ratings. No study has yet investigated the association between an academic department's research climate and undergraduate intellectual growth. Does a strong research orientation by an academic department promote or hinder student learning and growth? Are differences in departmental teaching and research climates associated with differences in the academic integration and intellectual growth of the undergraduates who major in those academic disciplines?

METHODS & VARIABLES

Figure 1 displays the conceptual model for our research. We are interested in examining departmental influences on undergraduate academic experiences and educational outcomes. Student outcomes result from a variety of campus and pre-college influences, but this study focuses on the ones in the solid boxes in Figure 1. While campus resources, student support services, and individual backgrounds all contribute to the academic and social integration of the student, these variables are not the focus of the current investigation. Our study views the academic department as an important component in the undergraduate experience and seeks to measure the relationship between variable department characteristics and the outcomes of students who major in those departments.

This study uses a population of faculty and graduating seniors in 27 different academic departments at a university classified by the Carnegie Foundation as a Research II institution. Our outcomes database consists of the combined responses of over 650 randomly selected seniors who entered the institution between 1978 and 1982 and who graduated between 1982 and 1986. We also conducted interviews with deans and chairs, and have access to university data on instructional contact hours, research grants, and faculty resumes.

Measures of Departmental Research Orientation

1. **Dean's Rating** of the climate for research and scholarship in each Department (High-Medium-Low).
2. **Grant Applications** per faculty member over an 8 year period: this is a measure of faculty effort to obtain external support.
3. **Grants Received** per faculty member over an 8 year period: this is a measure of faculty effectiveness in obtaining external support.
4. **Percent of Active Scholars** among the faculty in each department judged by a panel of three who screened their resumes.

These four research variables were converted into a scale with a reliability (ALPHA) of .90, indicating a high degree of congruence among the two judgemental and the two quantitative measures.

Measures of Departmental Teaching Orientation

1. Dean's Rating of each department's interest in undergraduate teaching over the eight year period (High-Medium-Low).
2. Student Ratings of faculty interest in teaching (individual ratings were aggregated to form departmental score averages).
3. Faculty undergraduate instructional contact hours averaged over the period of study (departmental averages were calculated from the university's course and section analysis).
4. Faculty/student contact hours outside of class reported by seniors (individual scores were aggregated to form departmental averages).
5. Evaluation Compliance - Degree of departmental compliance with a University policy calling for student ratings of instruction in all undergraduate courses.
6. Capstone Requirement - Whether or not the department requires its undergraduate majors to culminate the senior year with a capstone course, comprehensive exam, senior thesis, field work or some other integrative academic experience.

The first four of these teaching measures were converted into a scale with a reliability (ALPHA) of .57, indicating a modest degree of congruence among these four judgemental and quantitative measures.

Measures of Academic Integration

1. Faculty Relations - student responses to a 4 item scale developed by Pascarella and Terenzini and their associates.
2. Classroom involvement - student responses to a scale developed by Pascarella and Terenzini and their associates.
3. Faculty Concern - student responses to a 4 item scale developed by Pascarella and Terenzini and their associates.
4. Faculty Contact - Faculty student interaction outside of class reported by seniors.

TABLE 1

ALBANY GROWTH SCALES

Factors Resulting from Senior Responses
Reporting their Growth and Development at Albany*

Factor 1: Intellectual Growth (12 item Scale)

	Factor Loading	Item-Total Correlation
1. Gaining factual knowledge	.61	.74
2. Developing ability to evaluate ideas critically	.76	.80
3. Developing ability to apply abstractions in solving problems	.74	.75
4. Learning fundamental principles and theories	.59	.74
5. Learning how to learn	.60	.72
6. Developing analytical thinking	.70	.81
7. Developing the ability to learn on my own	.66	.77
8. Formulating creative ideas and solutions	.65	.74
9. Gaining exposure to new intellectual areas	.52	.72
10. Synthesizing information	.53	.78
11. Recognizing general principles	.51	.74
12. Developing intellectual curiosity	.49	.75

Alpha ( ) = .95

Factor 2: Disciplinary Skills (4 item scale)

	Factor Loading	Item-Total Correlation
1. Understanding research methods	.78	.77
2. Understanding schools of thought	.78	.83
3. Understanding disciplinary inter-relatedness	.70	.71

Alpha ( ) = .88

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* This factor analysis is based upon the combined responses of a sample of Albany seniors who graduated in Spring of 1982, 1984 and 1986 (n = 672). Their growth and development at Albany was self-reported on a nine-point scale where 1=no growth and 9=extraordinary growth.

Student Outcomes Measures

1. **Senior Year Intellectual Growth** - an 8 item scale (Alpha = .86) which asks seniors to indicate their growth during the past year on a 4 point scale developed by Pascarella and Terenzini and their associates (1978, 1980, 1982, 1984).
2. **Four Year Intellectual Growth** - a 12 item scale which asks seniors to indicate their growth over their entire college careers on a 9 point scale (Alpha = .95). The items are shown in Table 1.
3. **Senior Year Disciplinary Skills** - a 3 item scale (Alpha = .88) which asks seniors to indicate their growth in understanding their disciplines' research methods, schools of thought, and relatedness to other disciplines (See Table 1).
4. **Four Year Disciplinary Skills** - a similar 3 item scale asking seniors to indicate their growth over their entire college careers on a 9 point scale.
5. **Academic Satisfaction** - a 3 item Likert scale (Alpha = .80) which asks seniors to respond to statements about their intellectual and academic satisfaction.

TABLE 2

CORRELATIONS AMONG THE MEASURES OF RESEARCH AND TEACHING
(N = 27 Departments)

DEPARTMENT TEACHING VARIABLES	DEPARTMENT RESEARCH VARIABLES: Grant Applications	Grants Received	Dean Research Rating	Percent Active Scholars	Dept. Research Scale (Alpha =.90)
Dean Rating of Dept. Interest in U.G. Teaching	-.21***	-.19***	.17***	NS	-.10*
Student Rating of Faculty Interest in Teaching	-.23***	-.17***	NS	.14***	-.16***
Faculty Undergraduate Class Contact Hours	NS	NS	.21***	.49***	.31***
Faculty/Student Contact Outside Class	.20***	.20***	NS	.48***	.14***
Dept. Teaching Scale (Alpha = .57)	NS	NS	.20***	.49***	.16***

* = Significant at .05 level
** = Significant at .01 level
*** = Significant at .001 level

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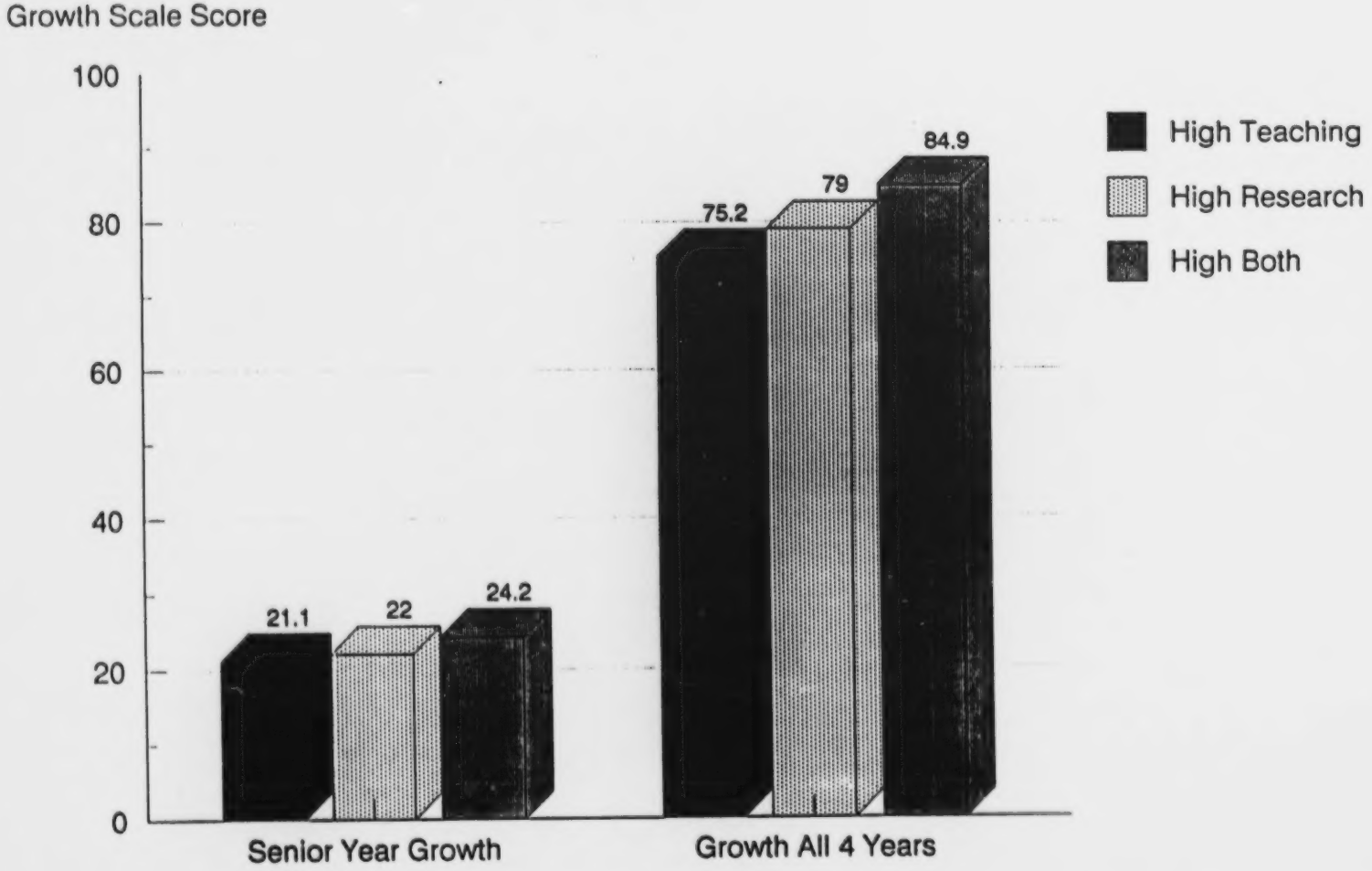
RESULTS

Based on the organizational literature, we entered the study with the assumption that different academic departments would have variable research climates and faculty orientations toward scholarship, and that these orientations would exhibit stability over time. These assumptions are confirmed by the findings. In the judgement of the deans and chairs we interviewed, there was little change in departmental research climates during the 8 years between 1978 and 1986. Faculty turnover and position growth in the 27 departments during this period was not high, and student selectivity at the university also remained about the same. More importantly, the quantitative research measures also exhibit stability, with high, medium, and low scoring departments remaining about the same relative to each other, over the eight year period.

Scores on the 4 item research scale range from 4 to 12 with a distribution of departments and student majors at each frequency. The four research measures combined to form a scale with a reliability (Alpha) of .90. We found similar differences among departmental teaching orientations. However, only four of the 6 measures are congruent enough to form a scale (Alpha = .57). We hypothesize that these departmental differences in research and teaching orientations impact undergraduate education in general, and their student majors in particular.

Our second important finding is that the teaching and research measures in the aggregate are positively correlated. The correlations among these teaching and research measures are shown in Table 2. While grant applications and grants received are negatively correlated with the deans and students ratings of teaching, they are positively correlated with faculty-student contact. The two other research variables (deans rating and percent judged to be active scholars) are positively correlated with several of the teaching variables and with the teaching scale as a whole. The two scales show a low but positive and statistically significant relationship.(r=.16) This level is low enough to suggest that teaching and research are relatively independent faculty activities, but high enough to undercut the rhetoric in the field which views research and teaching emphases to be negatively associated.

Average Intellectual Growth Scores Reported by Seniors Majoring in Three Different Types of Departments



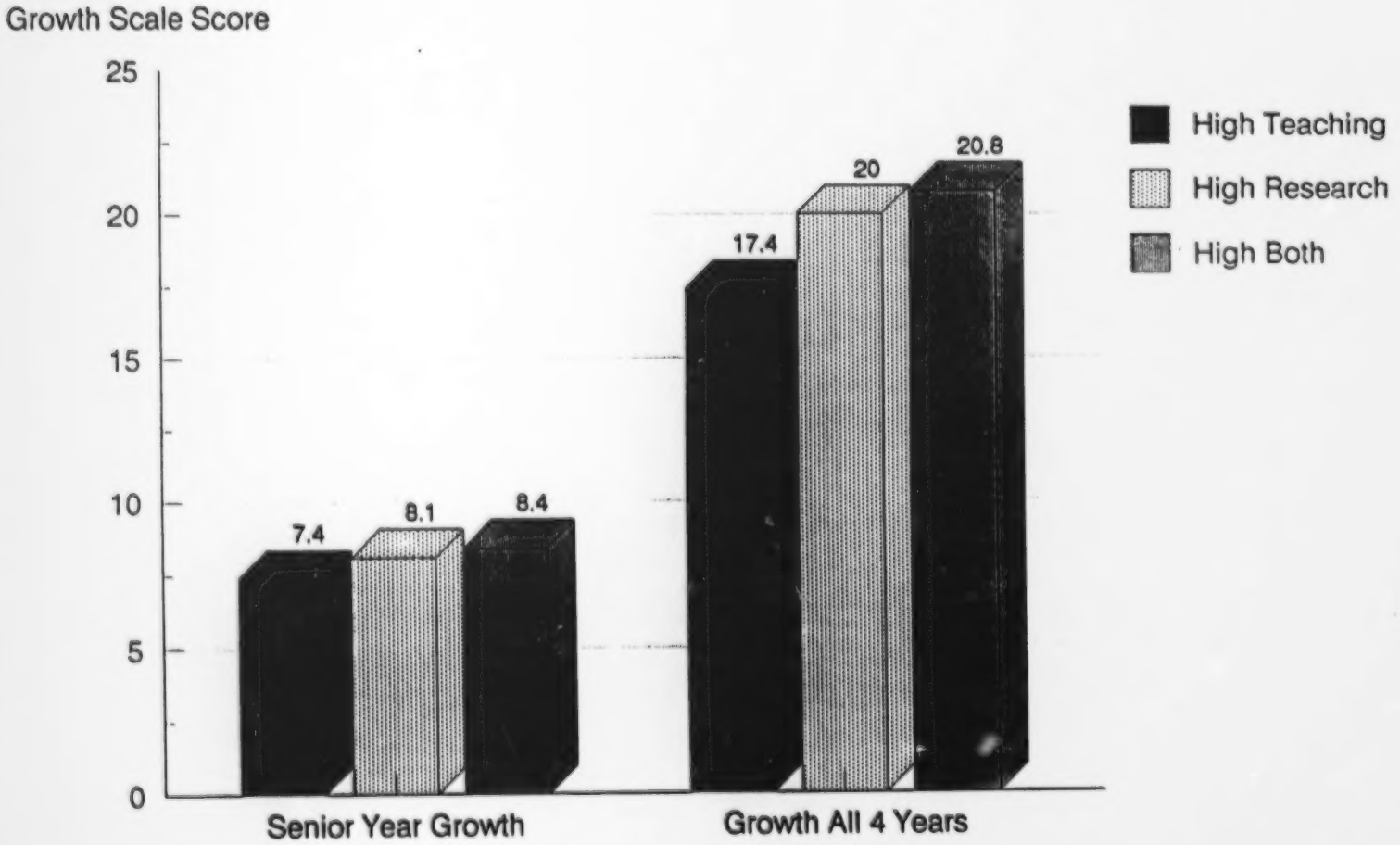
To investigate the relationship between departmental orientations and student outcomes, we used the research and teaching scales to divide the departments into high, medium, and low trichotomies on each of the separate measures. We then calculated their scores on the outcomes measures. Figures 2 & 3 show the average intellectual growth and disciplinary skills scores reported by seniors in three different types of departments: high teaching/low research, high research/low teaching, and high on both teaching and research. In both figures, the lowest average growth scores are from those seniors majoring in departments rated high teaching/low research, and the highest scores are attained by seniors who major in departments rated high on both. This pattern holds true both for their growth in the senior year and for the growth they reported for the entire four years at the university. Therefore, students in research oriented departments reported more growth than those in teaching oriented departments.

Similar results were obtained when we looked at the relationship among the two department scales and the academic integration measures. The highest scores on the academic satisfaction, faculty relations, faculty concern and classroom involvement scales were reported by seniors who majored in departments scoring high on both teaching and research. Thus, departmental climate appears to make a significant contribution to the academic integration of undergraduate majors, and a strong research orientation appears to promote, rather than hinder student academic adjustment.

DISCUSSION

Naturally, the findings are limited by the nature of the sample and the measures being employed. Not all institutions are universities, and students (even graduating seniors) do not take all their courses in the major department. Nevertheless, one's academic department is sufficiently influential in the undergraduate experience to justify its inclusion as an object of study. The measures of self-reported growth may not be as scientific as an objective pre-test post-test method, but our dependent measures have been tested in prior studies and are cost effective. The variety of our measures also provides diversity which guards against the weakness of relying on a single criterion.

Average Disciplinary Skills Scores Reported by Seniors Majoring in Three Different Types of Departments



We also are not able to control for the variable influence of different academic fields. The particular university used in this study had a range of departments which exhibited wide varieties of teaching and research characteristics. This benefited our analysis. But a multicampus study might yield more statistical power, and enable researchers to control for the influence of academic disciplines.

Nevertheless, our results strongly suggest that a vigorous research orientation by an academic department, particularly when combined with attention to teaching responsibilities, has a beneficial influence on the academic integration and intellectual growth of their undergraduate majors.

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